

Chapter 4: Future Transportation Needs

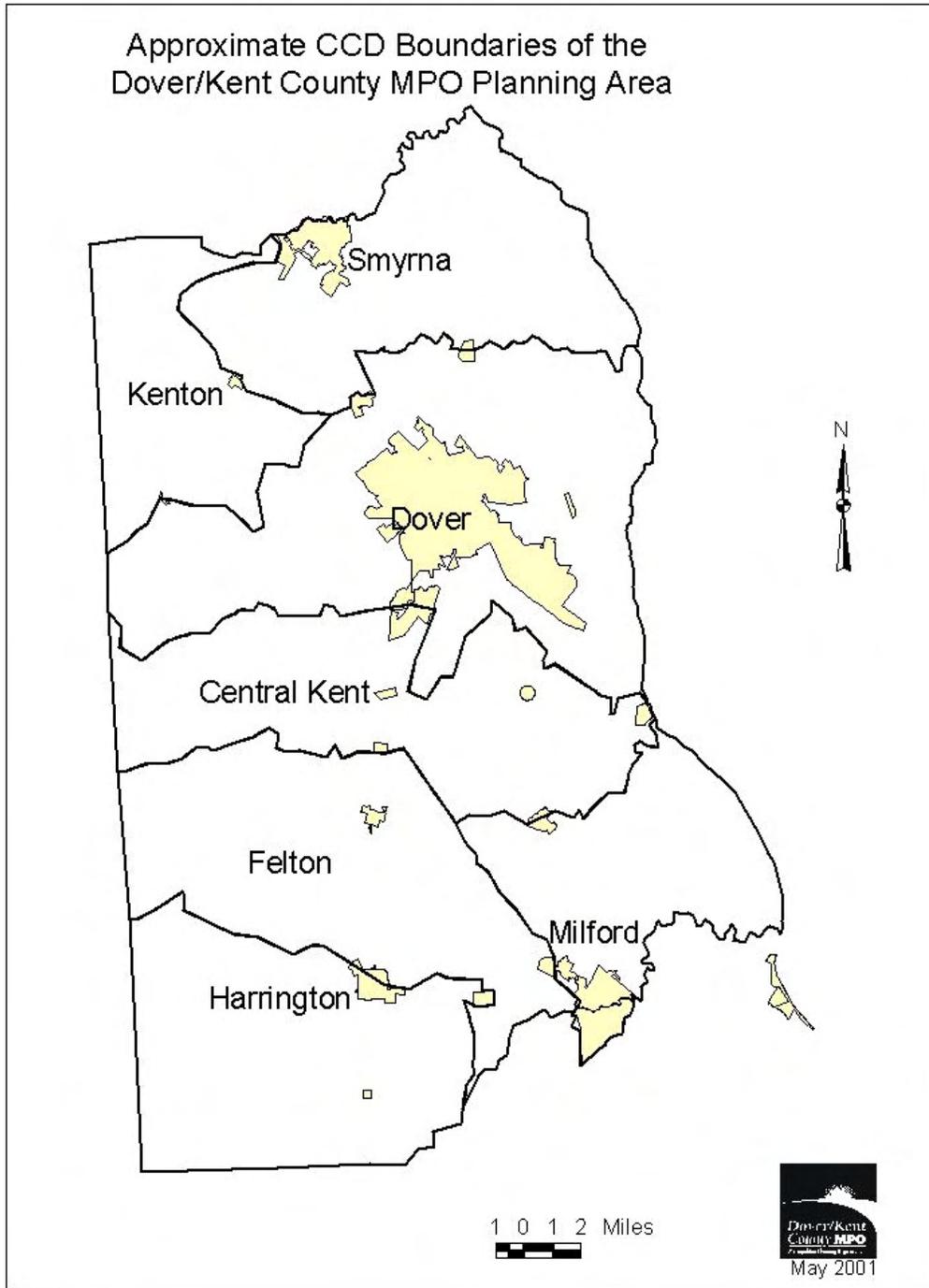
The economic vitality of a region depends upon a reliable and efficient transportation system. Transportation allows people to travel to work, shopping, to school and other destinations, and it allows goods and services to reach people. Transportation needs are based upon the demand for movement of goods and people compared to the supply of transportation facilities. Thus, to understand the future transportation needs of Kent County, it is necessary to understand where people will live and work, the ways in which they will make use of the land, and the travel choices they traditionally make. In general, congestion and cost have triggered most metropolitan areas to focus on coordination and streamlining of transportation systems and to provide facilities and systems for alternative modes of travel. This plan evaluates not only supply and demand factors but also considers the effects of land use policies in conjunction with traffic forecasting.

Various trends are examined and modeled to support identification of future transportation needs. The following is a discussion of population and employment trends, future land use based upon various growth scenarios, travel trends and customer satisfaction surveys. The analysis is based upon a travel demand model considering land use policies.

Population and Employment Trends

Population and employment projections, which predict where people will live and work, were developed by the Delaware Population Consortium, a statewide organization mandated by the state legislature to perform that task. The consortium uses data gathered by the US Bureau of the Census and other federal agencies and projects growth based on national trends, local land use plans, local trends, and local knowledge provided by area planning officials. The data is calculated at the county level, then disaggregated into Census County Divisions (CCDs). To use the data in transportation planning, it is distributed among Traffic Analysis Zones (TAZs), which are the base units of DelDOT's travel demand model. There are 166 TAZs in the Dover/Kent County MPO planning area (with the 2004 TAZ update). In order to show growth trends in various areas, the TAZs were aggregated to approximate CCDs, shown in Figure 4.1.

**Figure 4.1
CCD Boundaries**



Source: Dover/Kent County MPO

As shown in Table 4.1, the population of the Dover/Kent County MPO planning area is expected to grow by one-quarter or 25 percent (25%) between 2000 and 2030. The central portion (Dover Area and Central Kent County) of the county is expected to remain the most heavily populated and grow twenty-two and seventeen percent respectively by 2030. Substantial growth is projected for the Smyrna Area with an anticipated forty-eight percent increase by 2030.

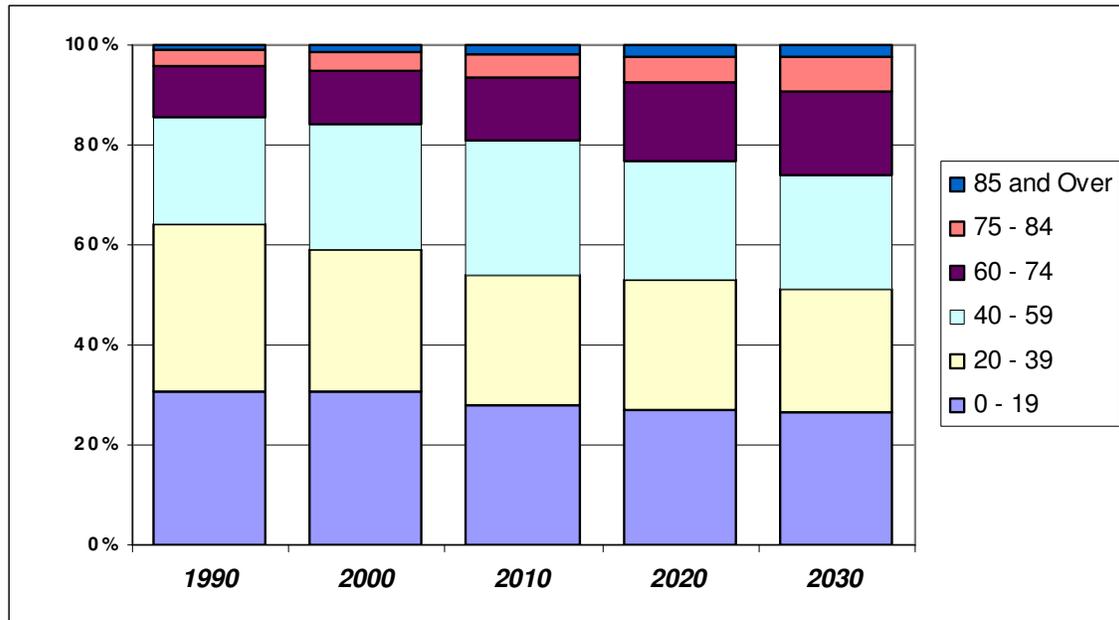
**Table 4.1
Dover/Kent County MPO Planning Area Population Forecasts: 1990 through 2030**

MPO Area by CCD	1990	2000	2005	2010	2015	2025	2030	Percent Change 2000 - 2030
Central Kent County	13,165	18,083	19,553	20,609	21,404	22,666	23,132	22%
Dover Area	55,699	66,027	69,759	72,407	74,498	78,382	79,788	17%
Felton Area	9,153	6,109	6,548	6,773	6,946	7,222	7,296	16%
Harrington Area	9,729	10,860	11,859	12,537	13,050	13,995	14,277	24%
Kenton Area	6,075	5,985	6,579	6,968	7,265	7,768	8,204	27%
Milford Area	8,468	16,816	20,798	22,475	22,966	25,166	25,612	34%
Smyrna Area	12,234	13,113	16,138	18,447	20,224	23,914	25,269	48%
Total	114,523	136,993	151,234	160,216	166,353	179,113	183,578	25%

Note: Milford and Smyrna populations include the Sussex County and New Castle County portions of those municipalities

Sources: United States Census Bureau (1990 and 2000 data); Delaware Population Consortium 2004 Population Projections by CCD based on September 29, 2004 Population Consortium Control Total - Adjusted based on December 15, 2004 Comments.

Figure 4.2
Kent County Population by Age Group as a Percentage of Total Population



Source: United States Census Bureau (1990 and 2000 data); Delaware Population Consortium Projections 2003.

Kent County’s population is projected to continue aging during the next 25-30 years. Figure 4.2 illustrates the change in population by age cohorts, between 1990 as projected to 2030. As the chart illustrates, the age cohorts less than 60 years old are not projected to significantly increase, while the age cohorts age 60 and older are projected to increase significantly, or between 50% to 60% by 2030. Nearly one-quarter (26.2%) of the entire population is projected to be older than 60 by 2030. Since, the elderly typically have different needs in terms of mobility, services, and access it is important to consider those needs for future land use and transportation planning.

Another important population characteristic is number and size of households, since travel is usually a household decision. As shown in Table 4.2, according to the Delaware Population Consortium projections, an average of 2.88 persons will reside in each household in Kent County in by 2005. The average persons per household is expected to fluctuate and slightly decrease by 2030 to 2.82 persons per household. However the total number of households is expected to increase by approximately 18,000 households over the next 25-30 years. The projected increase in households translates to a greater demand for goods, services, and employment, thereby placing a greater demand on the transportation system.

Table 4.2
Kent County Population: Average Persons per Household - 1990 through 2030

Year	Population	Households	Average Persons per Household
1990	114,523	39,563	2.89
2000	136,993	48,618	2.82
2005	151,234	52,576	2.88
2010	160,216	55,633	2.88
2015	166,353	58,456	2.85
2025	179,113	63,255	2.83
2030	183,578	65,023	2.82

Sources: United States Census Bureau (1990 and 2000 data); Delaware Population Consortium Projections 2004, and 2004 Kent County Planning Household Projections.

Table 4.3 illustrates that total employment within the MPO planning area is projected to increase by 18 percent between 2000 and 2030 (32% between 1990 and 2030). The increase is indicative of the projected population growth with a modest to conservative projection for employment growth. The Dover area is expected to contain the majority of the total number of jobs, while Milford and Smyrna are projected to have the largest percent increases in employment.

Table 4.3
Dover/Kent County MPO Planning Area Employment Forecasts: 1990 through 2030

MPO Area by CCD	1990	2000	2005	2010	2015	2020	2025	2030	Percent Change 2000 - 2030
Central Kent County	834	2,699	2,995	3,093	3,172	3,239	3,304	3,379	20%
Dover Area	35,459	43,637	47,751	48,705	49,399	49,969	50,526	51,136	15%
Felton Area	1,470	2,533	2,790	2,859	2,914	2,955	2,999	3,053	17%
Harrington Area	3,978	1,807	2,000	2,058	2,107	2,145	2,183	2,229	19%
Kenton Area	483	440	490	507	522	533	545	558	21%
Milford Area	8,796	9,471	10,463	11,054	11,535	11,918	12,231	12,536	24%
Smyrna Area	4,183	6,019	7,313	7,773	7,817	7,858	7,890	8,065	25%
Total	55,203	66,606	73,802	76,049	77,466	78,617	79,678	80,956	18%

Note: Milford and Smyrna populations include the Sussex County and New Castle County portions of those municipalities

Source: Delaware Population Consortium Projections 2001 and 2003.

Government and community services are expected to remain the most important segment of the economy, providing approximately 42 percent of all jobs. Dover Air Force Base remains a major engine of economic stability in the area, being directly responsible for 2,000 jobs and indirectly responsible for approximately 3,400 others. Growth in community services may be particularly noticeable in the healthcare field, since an older population will require more of these services than the population at-

large, and recent changes in policy require military dependents to use local facilities. Retail employment is expected to remain strong at just under one quarter of the total employment in the region. Manufacturing employment is expected to drop by about two percent.

Land Use Trends and Analysis of Growth Scenarios

Land use patterns greatly influence regional travel patterns; in turn the degree of access provided by the transportation system can influence land development patterns. Transportation planners must make every effort to consider the comprehensive land use plans of the region and local jurisdictions and collaborate with land use planners within the region. Federal planning regulations place considerable importance on the link between transportation planning and land use. According to FHWA regulations for metropolitan and statewide planning, the metropolitan planning process should consider the following with respect to land use and transportation planning:

- the likely affect of transportation policy decisions on land use and development and the consistency of transportation plans and programs with the provisions of all applicable short- and long-term land use and development plans; and
- the area's comprehensive long-range land use plan and metropolitan development objectives, national, state and local housing goals and strategies, community development and employment plans and strategies.

Therefore, the transportation planning process and plan analysis considered three growth scenarios to analyze impacts to the transportation network. Of these scenarios, two scenarios a Livable Delaware Scenario (preferred future 2030) and a Growth Beyond the Growth Area Scenario (alternative future 2030) were analyzed closely. The following provides an overview of the analysis of land use scenarios used to support transportation modeling.

CorPlan Land Use Modeling

The Dover/Kent County MPO utilized the land use model, CorPlan, in conjunction with DelDOT's transportation model, TRANPLAN, to successfully integrate land use and transportation planning efforts to support preparation of the Long Range Transportation Plan for 2030. A community-based planning model, CorPlan estimates regional land development potential. This model provides a framework for assessing impacts of various growth patterns across the MPO.

The capabilities of both models were utilized to assess the impacts of preferred scenario for future development and two alternatives scenarios. The long range planning study area included all of Kent County, the southern portion of New Castle County and the northern portion of Sussex County.

The CorPlan model was developed in a Microsoft Excel® spreadsheet with links to ESRI's ARCVIEW® geographic information system (GIS) software. CorPlan was funded by a Transportation and Community and System Preservation (TCSP) grant from the Federal Highway Administration (FHWA). The grant helped fund the Eastern Area Planning Initiative conducted by the Thomas Jefferson Planning District Commission, located in Charlottesville, Virginia. The original version of CorPlan is available through FHWA to Metropolitan Planning Organizations (MPOs) and other agencies. The original model was modified to meet the land use and transportation planning needs of the Dover/Kent County MPO to support preparation of the Long Range Transportation Plan for 2030.

Land Use Scenarios

The land use scenarios are based on several datasets including the Delaware 2002 land use land cover data, 2004 Traffic Analysis Zone boundaries, Growth Areas, parcels data from the 2004 State of Delaware Office of State Planning Coordination; Delaware Department of Agriculture Statewide Agricultural District data regarding 2004 Purchase of Development Rights (PDR), Delaware Department of Natural Resources and Environmental Control (DNREC) flood and floodplain data (which was collected through the Federal Emergency Management Agency); Delaware Population Consortium population and employment data and projections, Kent County subdivision - land development data and housing projection data, and United States Census Bureau population and socioeconomic data. Refinement of datasets included using post 2002 comprehensive plans, and land use assessments. Although the geographic datasets provided the bases for the land use model, future land use scenarios were based on land available for development, current development, population and housing trends, and other variables as described for the following future scenarios.

- **Preferred Future: Livable Delaware Scenario 2030 (“*smart growth*” scenario)**

This scenario is based on several adopted policies and documents as well as the analysis to support maps and strategies identified from the 2004 Strategies for State Policies and Spending, “Shaping Delaware’s Future: Managing Growth in 21st Century Delaware.” The assumption for this scenario is that growth is anticipated to occur within the Growth Area as described in the 2004 Strategies for State Policies and Spending and include Investment Levels 1, 2 and 3. The emphasis of Livable Delaware is to continue the development of areas that are already being developed within the growth area, or to develop areas that already have adequate infrastructure to support development.

Characteristics of this scenario include: predominantly medium density residential development, with modest allocations for employment centers and employment opportunities. All development is anticipated within the Growth Areas and along existing transportation corridors and network. This scenario shows the impacts on the transportation system based upon adherence to existing land use policies and plans. This scenario is depicted in Figure 4.3, Preferred Future Scenario 2030.

- **Alternative Future Scenario 2030 Growth within the Growth Area (*moderate growth*)**

This scenario considers growth primarily within the designated Growth Areas. The assumption of this scenario is that growth occurs within the Growth Area as described in the 2004 Strategies for State Policies and Spending and Include Investment Levels 1, 2 and 3, and along transportation corridors adjacent to the growth area. This scenario portrays moderate, permitted development within the growth area and expansion of growth along corridors adjacent to the growth area.

The results of this scenario were similar to that of the Preferred Future Scenario previously described; therefore, it was not analyzed beyond comparison of projected population growth rates.

- **Alternative Future Scenario 2030 Growth beyond the Growth Area (*unconstrained growth scenario*)**

This scenario considers growth beyond the designated Growth Areas. This scenario assumes that current Kent County land use plans and policies that are effectively directing growth into the designated Kent County Growth Zone are abandoned in favor of growth, along transportation corridors adjacent to the growth area and beyond. The emphasis of this scenario is to portray rapid development within the growth area and expansion of growth along corridors adjacent to the growth area if current land use planning policies and regulatory programs are eliminated. It is important to point out that current growth management strategies enacted by Kent County in 2003 have resulted in over 80 percent of all new development occurring within the designated Growth Zone.

Characteristics of this scenario include: predominantly medium to high density residential development in the Growth Areas, with modest to medium allocations of low to medium density development in areas adjacent to the Growth Areas and very low residential density development in those areas adjacent to the Growth Areas (secondary areas – where it is now rural). The rural secondary growth areas of this scenario are anticipated to function similar to areas such as Wyoming, Camden, Viola, Woodside, and Felton within today's Growth Area. While the average persons per household are not anticipated to increase total households (translated to total trips) are anticipated to increase. Commercial areas or uses are anticipated to be sporadic and unplanned within the Growth Area with numerous strip malls or large box retail stores. This scenario is depicted in Figure 4.4, Alternative Future Scenario 2030.

Figure 4.3

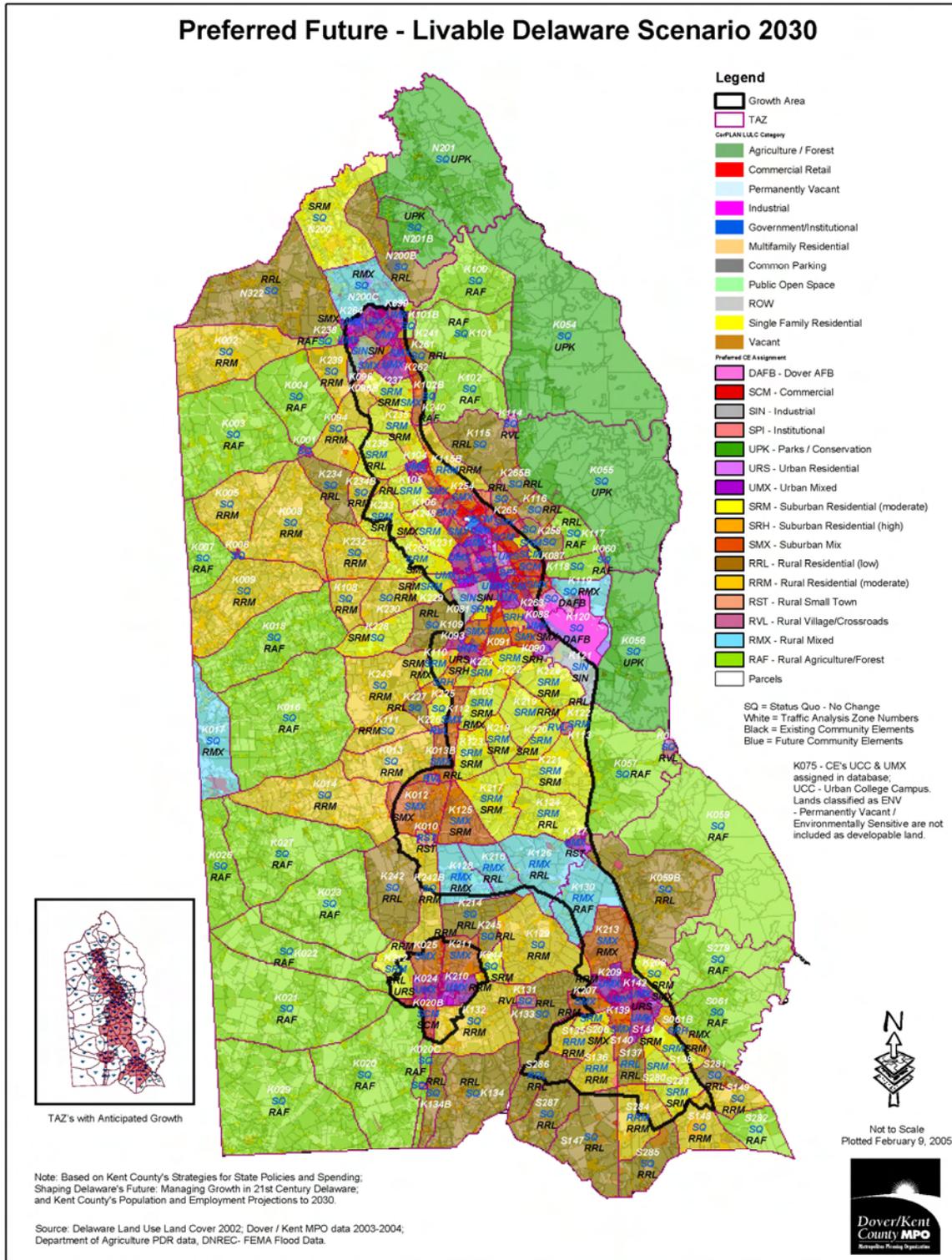
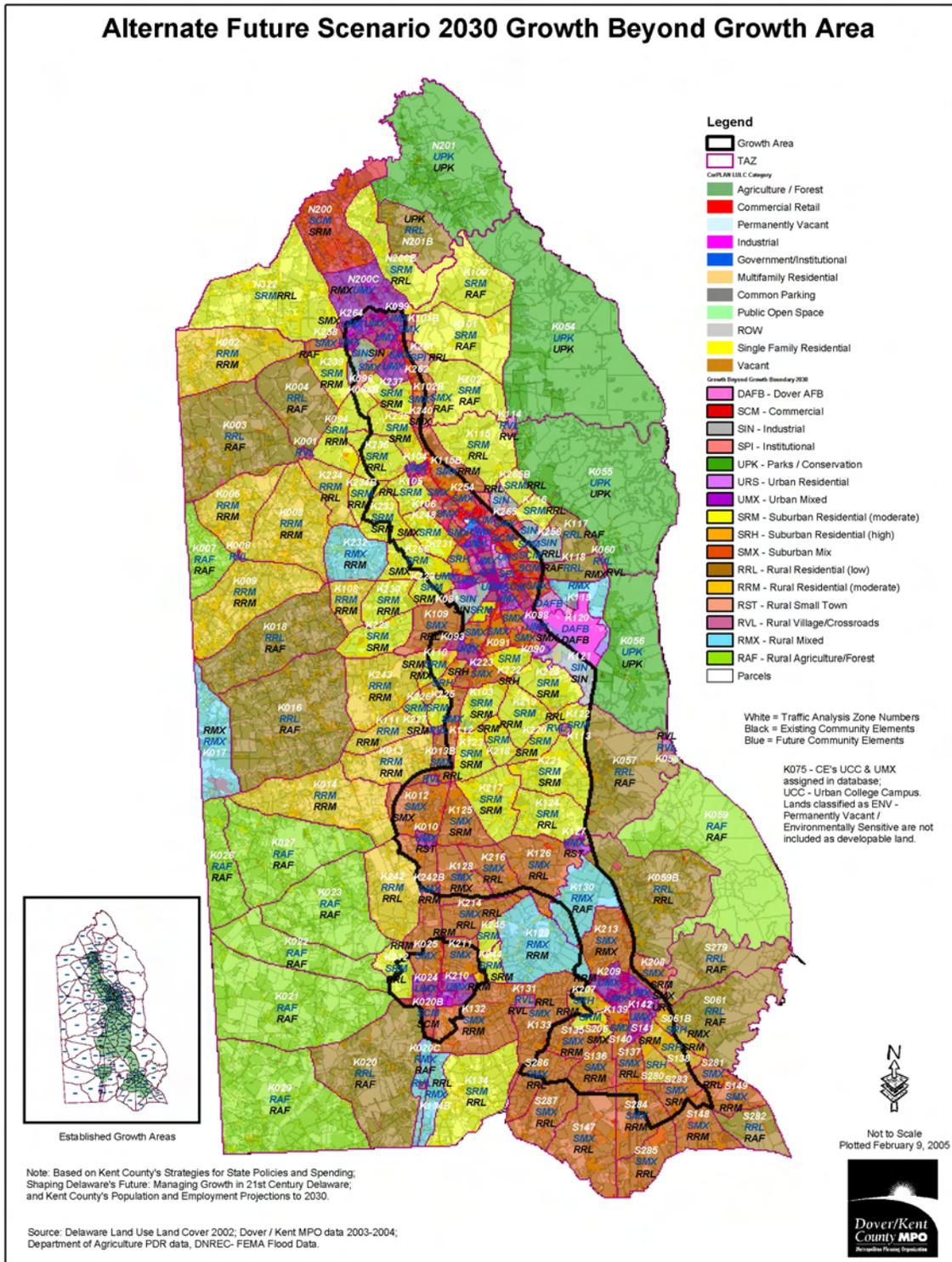


Figure 4.4



Comparison of Future Land Use Scenario Population Projections

A comparison between actual or existing conditions, Delaware Population Consortium projections and Dover/Kent MPO CorPlan model projections are provided in Table 4.4 Scenario Projections and Comparisons. The CorPlan model’s base calibrations (actual as compared to base) are within 2,525 dwelling units and 3,949 people of the actual conditions as reported using the 2002-2003 data from the Delaware Population Consortium.

The Delaware Population Consortium’s total population projections for 2030 include total occupied dwelling units of 74,062 with a 183,579 total population. The CorPlan model projection for the Preferred Future 2030 - Livable Delaware scenario includes 73,386 occupied dwelling units and a total population of 193,863. The DPC indicates a population per dwelling unit ratio of 2.47 while the Preferred Future 2030 - Livable Delaware scenario indicates a 2.64 persons per dwelling unit ratio. The Alternative Future Scenario 2030 – Growth Beyond the Growth Area projects 124,677 dwelling units and a total population of 321,794; which is a population per dwelling unit ratio of 2.58. Both scenarios were used as inputs for the assessment of transportation needs, and provided the basis for future Level of Service assessment.

**Table 4.4
Scenario Projections and Comparisons**

Scenario	Total Employees	Total Retail Employees	Total School Aged Children	Total Dwelling Units (Occupied)	Total Population
Actual	68,624	20,285	28,770	53,470	144,046
Base (Model)	68,624	20,285	28,770	55,995	147,995
<i>difference</i>	-	-	-	2,525	3,949
DPC Projections*	83,490	26,932	NA	74,062	183,579
Preferred Future - Livable Delaware 2030	71,539	22,461	56,696	73,386	193,863
Alternative Future Scenario 2030 – Growth Beyond the Growth Area	75,932	25,659	88,269	124,677	321,794

**Total Population from Delaware Population Consortium 2004 Population Projections by CCD based on September 29, 2004 Population Consortium Control Total and adjusted based on December 15, 2004 revised figures. All other DCP Projection data based on DPC 2003 Projections.*

Sources: United States Census Bureau (2000 data); Delaware Population Consortium; Dover / Kent MPO CorPlan Model 2004.

Travel Trends and Customer Satisfaction/Public Opinion

Travel Trends

Since 1996, no significant changes have occurred in other trends that influence transportation needs in the region. Specifically:

- Most workers continue to drive alone,
- Few workers choose to walk, bicycle, or carpool,
- More people are riding transit, but not to work,
- The number of vehicles owned by each household is increasing, with most households owning at least two vehicles, and
- The annual number of vehicle miles traveled has increased at a greater rate than total roadway mileage, vehicles, or drivers.

In addition, average trip length for work trips is expected to continue to increase from 9.8 miles in 1999 to 10 miles in 2030 as estimated by DeIDOT. With the completion of SR 1 to I-95, this trend could increase at an even higher rate. Conversely, auto occupancy continues to decrease. In short, more vehicles are being driven more miles while carrying fewer people.

A growing population, a larger employment base, and a continuation of the travel choices that Kent Countians have been making, will result in increased travel demands. In addition, an aging population will place different demands on the transportation system than a younger population. As a result, the mobility needs of Kent Countians will be greater and more diverse in 2030 than today.

Customer Satisfaction Survey/Public Opinion

DeIDOT routinely conducts a random sample survey, and a Customer Satisfaction Survey, of the traveling public including businesses that ship and receive goods to determine how well the Department is meeting transportation needs. The survey considers all modes that move people and goods. These survey results are used to better understand what features of the transportation system are most important to system users. In addition to DeIDOT's Customer Satisfaction Survey, the Dover/Kent County MPO conducted a random sample survey of customers within the study area for the MPO. In addition to trends and analysis, the survey helps to identify needs of system users. The following tables summarize key areas of need according to respective surveys; Table 4.5 is a summary of the statewide Customer Satisfaction Survey completed by DeIDOT in 2003, and Table 4.6 is a summary of the Dover / Kent County MPO Public Opinion Survey. The survey instruments and detailed results are available in Appendix D. Customer Satisfaction and Public Opinion Survey.

The DeIDOT Customer Satisfaction survey results indicate that motorists are most satisfied with keeping lands adjacent to highways landscaped and mowed; highway signs that provide direction and mileage; and having many travel mode choices. The motorists lowest levels of satisfaction include well planned sequencing and timing of traffic lights; and highways free of congestion. Table 4.5 is a rating of service provided as measured through a performance versus importance ratio. The topics listed in the box 1 are those topics which are important to motorists and which DeIDOT is providing a good service; whereas the items listed in the box 4 are those topics which are of importance to motorist but which DeIDOT can improve services.

**Table 4.5
DeIDOT 2003 Customer Satisfaction Survey Summary**

		Importance	
		Below Average	Above Average
Performance	Above Average	Maintenance: Low Priority Litter Free Highways Info on Delays & Closings Landscaping & Mowing 2	Maintenance: High Priority Snow Plowing & Salting Clear Lane Lines Pavement Condition Directional Hwy Signs 1
	Below Average	Corrective: Low Priority Mode Choice 3	Corrective: High Priority Highways Free of Congestion Sequencing/Timing of Signals 4

Sources: DeIDOT 2003 Customer Satisfaction Survey

The Dover / Kent County MPO Public Opinion Survey indicates that motorists recommend roadway improvements and widening, intersection improvements, expanded and increased frequency of bus service, and consideration for commuter rail service. Other summary results of the survey are provided in Table 4.6, where regional needs according to transportation topic are identified. A check in the transportation topic box indicate that the survey respondents indicated a need for the service or facility.

**Table 4.6
Dover / Kent County MPO Public Opinion Survey Summary**

Important Features of Transportation System and Needs	Regional Needs
Highways/Roadways	
Highways free of congestion	
Improved sequencing and timing of traffic lights	
HOV lanes on highways for car, vanpools and buses	
Improve intersections with turn lanes, traffic signals and widening	<input checked="" type="checkbox"/>
Information on when to expect delays and closings	
Implement new technologies to make highways more efficient	
Provide additional exits along interstate to provide better access for movement of goods	<input checked="" type="checkbox"/>
Highways with wide travel lanes to accommodate trucks	
Transit/Other Modes	
Adequate lighting at transit stops and stations	
Design communities with a transportation network that supports walking and bicycling	<input checked="" type="checkbox"/>
<ul style="list-style-type: none"> • Streetscape improvements (sidewalks, street trees, pedestrian lighting and pedestrian signals and push buttons) 	<input checked="" type="checkbox"/>
<ul style="list-style-type: none"> • Wide, paved shoulders to accommodate bicycles 	<input checked="" type="checkbox"/>
<ul style="list-style-type: none"> • Lower volume and lower speeds 	<input checked="" type="checkbox"/>
<ul style="list-style-type: none"> • Improved sight distance 	<input checked="" type="checkbox"/>
<ul style="list-style-type: none"> • Improve signage indicating pedestrian and bicycle activity 	<input checked="" type="checkbox"/>
<ul style="list-style-type: none"> • Designated bicycle lanes and pedestrian/bicycle paths and trails 	<input checked="" type="checkbox"/>
Improve bus connections, expanded bus service and increased frequency	<input checked="" type="checkbox"/>
Additional park and ride facilities	<input checked="" type="checkbox"/>
Railroads	
Multi-track rail operations	
Truck to rail commodity transfer points	
Commuter rail service	<input checked="" type="checkbox"/>
Aviation	
Improve access to airports	<input checked="" type="checkbox"/>

Dover/Kent MPO 2002-2003 Public Opinion Survey

Assessing Future Transportation Needs

To determine future transportation needs, the MPO scrutinized not only the trends described above, but used those trends to develop travel demand forecasts indicating the highways on which congestion could be expected by 2030. Once those highways were identified, strategies and actions could be examined and analyzed for their value to mitigate expected deficiencies.

Travel Demand Analysis

To develop travel demand forecasts that would identify transportation system deficiencies, it was necessary to generate traffic volumes to represent:

- Existing conditions;
- Future conditions with respect to various growth policies (*preferred 2030 and alternative 2030 scenarios under a no-build*); and
- Future conditions with changes (*2030 build*) under the preferred 2030 scenario with alternative transportation strategies.

Outputs from the land use modeling (CorPlan) were utilized as input for the travel demand analysis to further support the integration of land use and transportation planning. The results of these scenarios are depicted in this section.

Travel Demand Analysis Methodology

The traffic volumes were calculated and assigned to the roadway network by means of DelDOT's TRANPLAN computer model of Kent and Sussex Counties. The model uses a three-step process to model travel. Demographic data is used to determine how many trips are generated by each TAZ, and the TAZ to which each trip is destined. Trips are assigned to paths along the highway network based on minimal path travel times, forming link volumes. The minimum path between zones is calculated on the basis of link length, highway type, and link volumes. A more detailed explanation of this process is located in Appendix A.

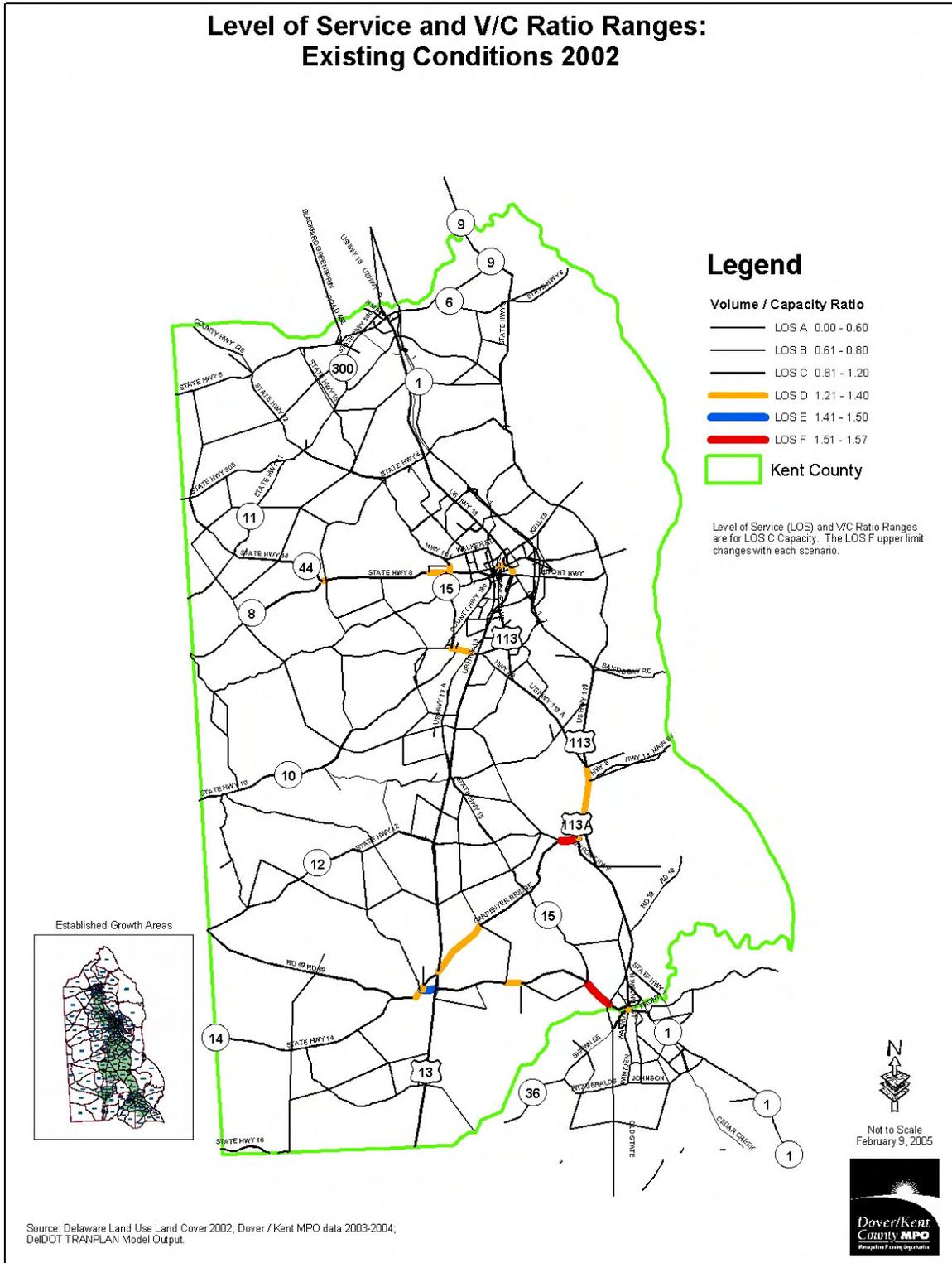
Over the last five years, the MPO member governments have developed land use policies intended to manage demand for public services by managing growth. Those efforts culminated in adoption of the Kent County Growth Zone map and the Cabinet Committee on State Planning Issues' *Strategies for State Policies and Spending*. These documents recognize the impact of sprawl, which necessitates travel by private automobile, on the region's mobility. Sprawl places greater demand on the transportation system, requiring more costly public investment in maintenance and possible expansion of existing facilities and increased travel costs for residents. Consequently, these policies encourage growth in areas close to existing infrastructure by means of a facilitated development process and public funding.

The changes in these policies were reflected in the travel demand analysis through the redistribution of population to the TAZs. Representatives of state, county, and city planning offices met and worked together to reallocate population among the TAZs in the model. All of the shifts reflected land use and desired growth patterns that are being incorporated into the city and county comprehensive plans. This process also considered new developments that had been approved since the update of the county's land use map up to 2003. The redistributed population, along with the existing transportation system, comprised the "base case" scenario for each run of the model. The travel demand model was run with this scenario to indicate where current congestion problems exist. Congestion identified as part of the "base case" is shown in Figure 4.5. Congestion was defined as roadways with a volume-to-capacity (V/C) ratio of 1.2 or higher for a Level of Service C capacity. No analysis was performed to assess the impact of a further shift of new developments into designated growth areas.

Table 4.7 and Figure 4.6, Miles of Road by Level of Service (LOS), illustrate differences in miles of road and change in level of service between existing conditions and future scenarios. In each of the scenarios, a "no-build" scenario is assumed, meaning no improvements are made to the existing roadway network between now and 2030. The capacities assumed for the roadways use level of service C to represent full capacity.

As anticipated, an increase in number of trips with no improvements made to a roadway network, results in an increase in the total miles that are below a level of service C. The table and figure illustrate that the Growth Beyond the Growth Area 2030 scenario decreases the percent of miles of roadway with a level of service C or better by 21.5 percent. The Livable Delaware scenario reduces that number by only four percent. Thus the Livable Delaware scenario has less of a detrimental impact on the transportation system.

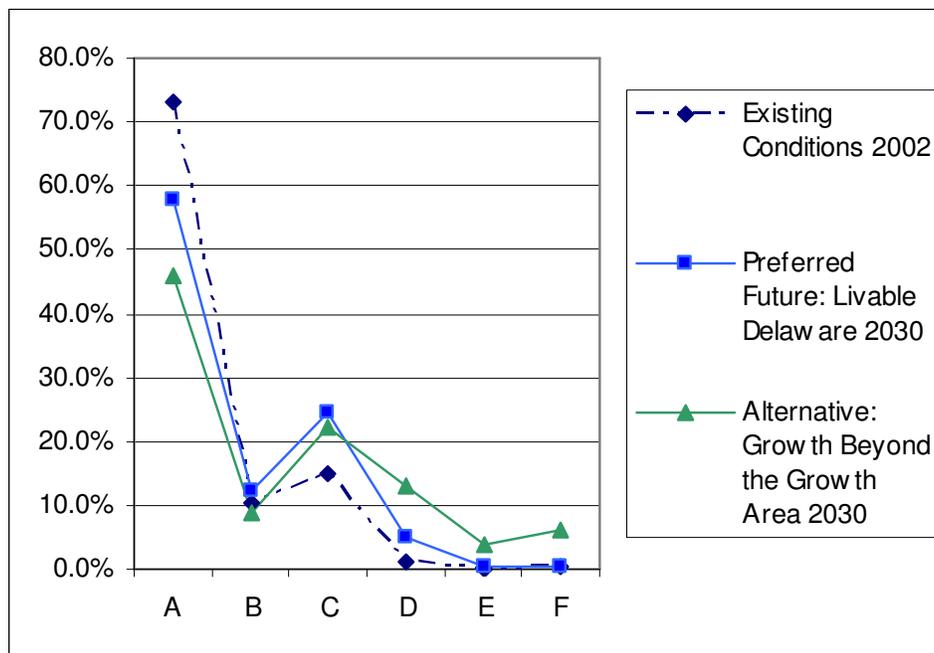
Figure 4.5
2005 Build LOS Map – Existing Conditions 2002



**Table 4.7
Miles of Road by Level of Service**

Level of Service	LOS C Capacity Base Ratio Ranges	Existing Conditions 2002	Percent of Total Miles	Preferred Future: Livable Delaware 2030	Percent of Total Miles	Alternative: Growth Beyond the Growth Area 2030	Percent of Total Miles
A	0.00 - 0.60	542.19	73.2%	438.68	57.8%	349.16	46.0%
B	0.60 - 0.80	76.28	10.3%	91.71	12.1%	68.29	9.0%
C	0.80 - 1.20	110.34	14.9%	184.74	24.3%	167.28	22.0%
D	1.20 - 1.40	9.22	1.2%	39.04	5.1%	98.58	13.0%
E	1.40 - 1.50	1.12	0.2%	2.79	0.4%	28.35	3.7%
F	>= 1.50	1.86	0.3%	2.47	0.3%	47.77	6.3%
Total		741.01		759.43		759.43	

**Figure 4.6
Miles of Road by Level of Service**



The analysis identified numerous roadway segments that would be deficient if current trends in population, employment and trip making continued and the roadway network was not improved. This was labeled the 2030 “No-build” scenario. Deficient segments include segments with a peak hour volume-to-capacity (V/C) ratio of 1.2 or greater for a Level of Service C capacity. The segments projected are to be deficient (Level of Service E and F) by 2030 are in Table 4.8 and shown in Figure 4.7.

Table 4.8
2030 “No Build” Deficient Roadway Segments

Roadway	Location	Segment	
US 13	Smyrna to Dover	Carter Road to Saulsbury Road	
	Dover	Crawford Carroll Avenue to College Road	
	Dover	College Road to North State Street	
	Dover	North State Street to Townsend Boulevard	
	Dover	Loockerman Street to Route 13/113 Split	
	Dover	Puncheon Run Connector to Governors Avenue	
	Dover	Governors Avenue to Meadow Glen	
	Camden	Route 10 to Lochmeath Way	
	Woodside	Upper King Road to Evans Road	
SR 1	Harrington	East Liberty to Fairground Road	
	Smyrna to Dover	South Smyrna Ramp to Saulsbury Road	
	Dover area	Old Lebanon Road to South State Street	
DE 15/DE 113A Upper King Rd.	Magnolia to Frederica	South State Street To Frederica Road	
	Frederica to Milford	North Frederica Road to New Wharf Road	
	Camden	Route 13 to Olin Hill Road	
DE 15 Scarborough Rd.		Olin Dill Road to Irish Hill Road	
	South of Canterbury	Irish Hill Road to Barratts Chapel Road	
Alt US 113 State St.	Dover	Crawford Carroll Avenue	
	Dover	Roosevelt Avenue to Route 13	
DE 8	South of Dover	Webbs Lane to Old Mill Road	
	South of Dover	Old Mill Road to Route 10	
DE 8	West of Dover	Artis Drive to Pearson’s Corner	
	West of Dover	Artis Drive to Mifflin Road	
	Dover	Saulsbury Road to Loockerman Street	
	Dover	Loockerman Street to West Street	
	Dover	North State Street to Kings Highway	
	Dover	Kings Highway to Park Drive	
	Dover	Kings Highway to Route 13	
	Dover	Route 13 to Halsey Road	
	Saulsbury Road	Dover	Walker Road to Clara Street
		Dover	Route 8 to Hazletville Road
US 13 Alt Governors Ave.	Dover	Walker Road to Mary Street	
Loockerman Street	Dover	Route 8 to Bradford Street	
	Dover	Federal Street to Park Drive	
Kenton Road	Dover	Walker Road to Fieldstone Court	

Roadway	Location	Segment
	Dover	Foxhall Drive to Route 8
<i>Walker Road</i>	Dover	North State Street to Dover High School
<i>K73 Hazletville Rd.</i>	Dover	Hazletville Road at Eden Hill
<i>DE 10</i>	Camden	Main Street to Route 13
<i>Kings Highway</i>	Dover	Route 8 to Route 13
<i>North State Street</i>	Dover	Route 13 to Walker Road
	Dover	Mary Street to Route 8
<i>Carter Road</i>	Smyrna	Route 6 to Route 13
<i>E. Liberty Street</i>	Harrington	Delaware Avenue to Route 13
<i>Camden/Wyoming Ave</i>	Wyoming and Camden	Wyoming Mill Road to Route 13
<i>Delaware Avenue</i>	Harrington	Vernon Road to Route 13
<i>Wyoming Mill Road</i>	Dover	New Burton Road to Camden/Wyoming Avenue
<i>Milford/Harrington Hwy</i>	Milford	Canterbury Road to Walnut Street
<i>Walnut Street</i>	Milford	Route 113 to 1BR
<i>Lakeview Avenue</i>	Milford	Route 113 to Washington Avenue
<i>Business Route 1/ Rehoboth Blvd.</i>	Milford	Cedar Beach Road to 2 nd Street

Alternatives Analysis

Similar to the 2020 plan approach, the basis for identification of strategies to alleviate these deficiencies was person mobility, not auto mobility; therefore, roadway improvements were one of an array of strategies examined. The TRANPLAN model used by DelDOT does not include transit, bicycle or pedestrian activities. To quantify the effects of increased use of these alternative modes, an overall reduction in trips was used in the model. Figures 4.7 and 4.8 illustrate the change in Level of Service with no-build for the existing transportation system based on the 2030 Preferred and 2030 Alternate Land Use Scenarios previously described. Figures 4.9 and 4.10 illustrate the Level of Service for a build scenario making improvements to the transportation system based upon various improvement strategies and projects.

Figure 4.7
“No Build” LOS Map – Preferred 2030 Scenario: Livable Delaware

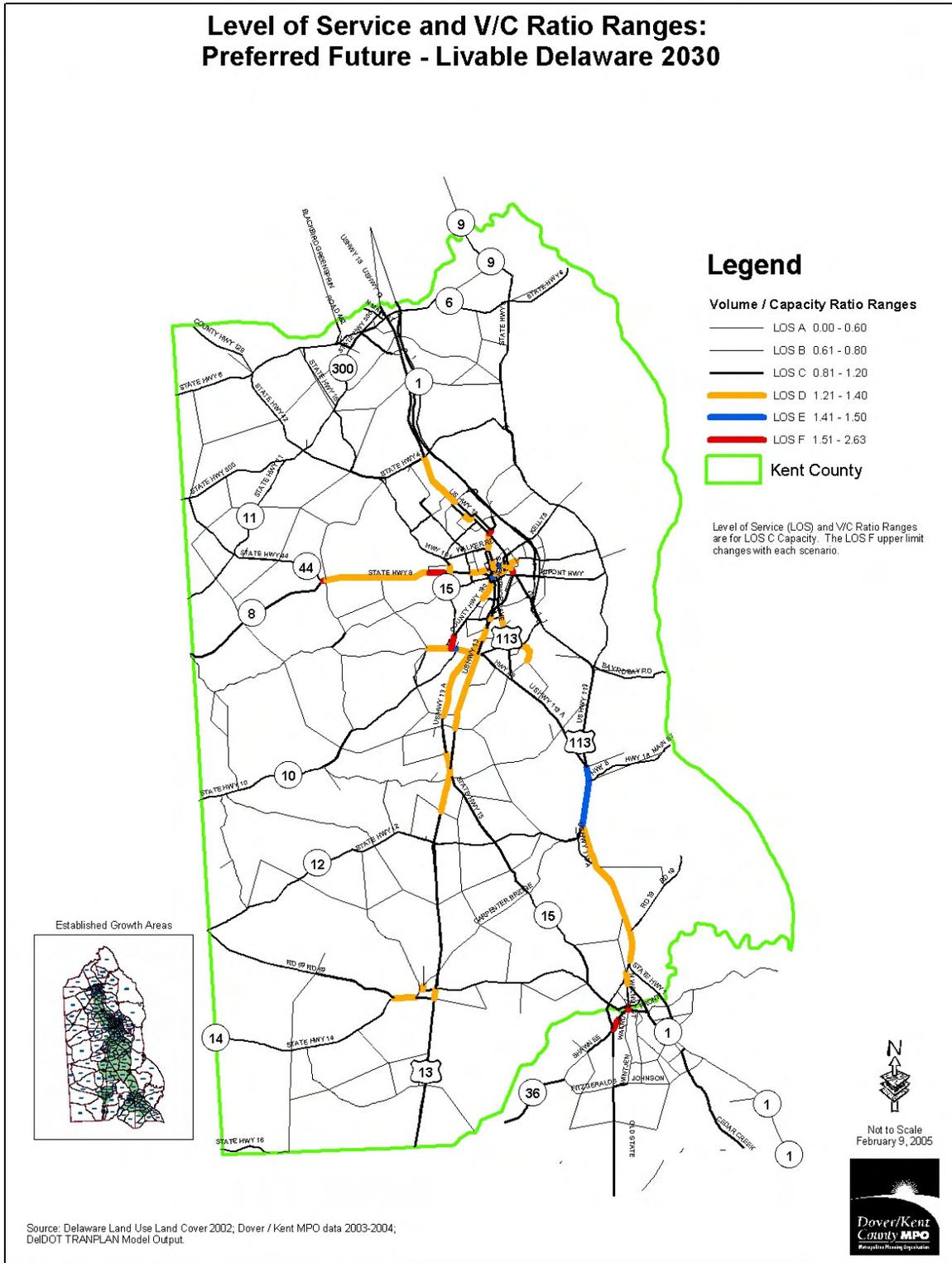
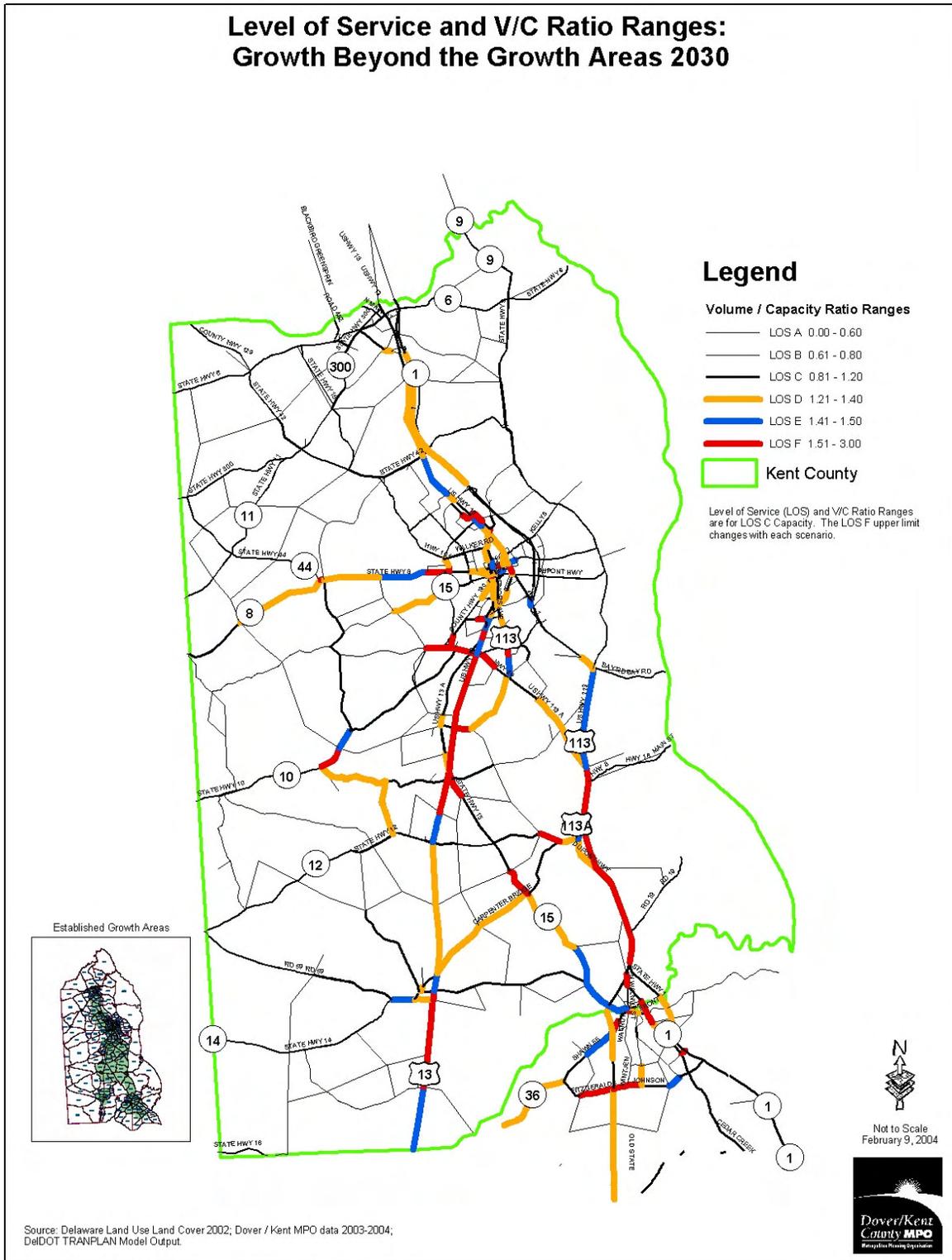


Figure 4.8
“No Build” LOS Map – Alternative 2030 Scenario: Growth beyond Growth Areas

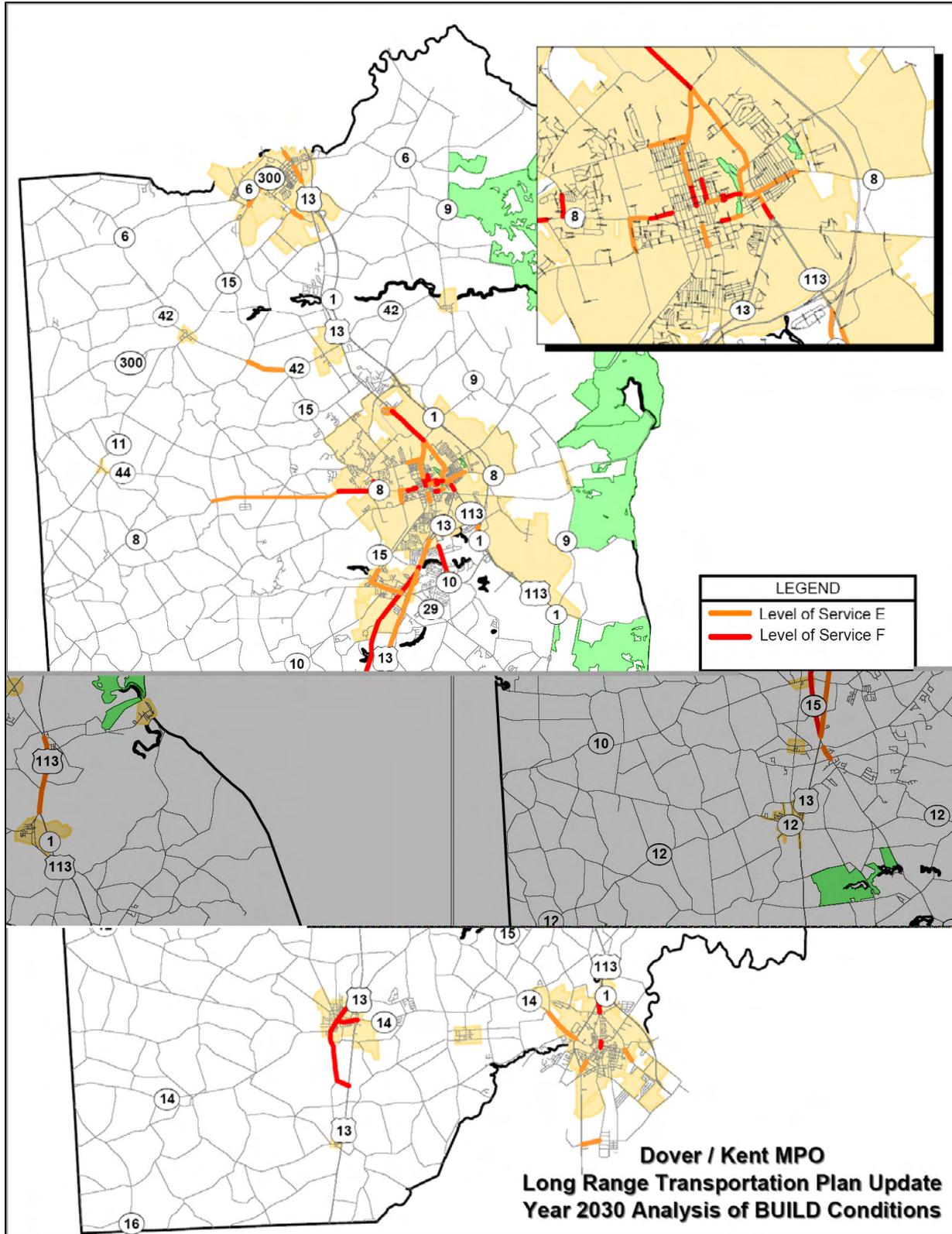


The “Build” analysis identified numerous roadway segments that would be deficient if current trends in population, employment and trip making continued and the roadway network included improvements. This was labeled the 2030 “Build” scenario. Deficient segments include segments with a peak hour volume-to-capacity (V/C) ratio of 1.2 or greater for a Level of Service C capacity. The segments projected to be deficient (Level of Service E and F) by 2030 are in Table 4.9 and shown in Figure 4.9.

Table 4.9
2030 “Build” Deficient Roadway Segments

Roadway	Location	Segment
US 13	Smyrna	Paddock Road to Glenwood Avenue
	Smyrna	Commerce Street to South Main Street
	Dover	College Avenue to N. State Street
	Dover	Division Street to US13/113 Split
	Dover	Webb's Lane to Irish Hill Road
SR 1/US113	Dover	SR9 to Clapham Road
SR 8	West of Dover	Pearson's Corner to Cranbury Run
	Dover	Cranberry Run to Mifflin Road
	Dover	Saulsbury Road to Loockerman Street
	Dover	Loockerman to US 13
	Dover	US13 to Acorn Lane
SR15/US13A	Camden to Woodside	US13 to US13
SR14	Milford	SR15 to US113
SR42	Kenton area	Seeneytown Road to Kenton Road
SR300	Smyrna	School Lane to DE 6
Camden Wyoming Avenue	Wyoming to Camen	RR Avenue to US13
Carter Road	Smyrna	Sunnyside Road to US13
College Avenue	Dover	McKee Road to US13
Delaware Avenue	Harrington	US13 to Main Street
Fairground Road	Harrington	Farmington Road to US 13
Governor's Avenue	Dover	Walker Drive to SR8
Kenton Road	Dover	Walker Road to SR8
Lakeview Avenue	Milford	US113 to Front Street
Main Street	Harrington	US13 to Vernon Road
Governors Ave	Dover	US13 to Walker Road
N. State Street	Dover	Mary Street to Division Street
Saulsbury Road	Dover	SR8 to Hazletville Road
S. State Street	Dover area	Old Mill Road to E. Lebanon Road
Walnut Street	Milford	US113 to Airport Road
Western RR Avenue	Wyoming	New Burton to Camden Wyoming Avenue

Figure 4.9
“Build” LOS MAP - Preferred Future: Livable Delaware



Conclusions

The purpose of utilizing the CorPlan model was to demonstrate the direct relationship between land use and transportation through an analysis of the impact of land use on future transportation needs. The analysis demonstrated the challenges associated with each scenario by providing the data used by the TRANPLAN model to determine where future congestion would likely occur. Population and employment generated by the Growth Beyond the Growth Area scenario clearly generated congestion on more roadways than the Livable Delaware scenario.

The result of the land use and transportation modeling supports the transportation goals and objectives in this plan, and provides the framework for implementation and investment strategies. The following summarizes key conclusions based upon the land use and transportation analysis supporting this planning process.

- Implementation of the Preferred Future - Livable Delaware 2030 scenario, and adherence to a managed approach to development will present transportation challenges requiring investments consistent with the 2004 Strategies for State Policies in Spending and the Kent County and municipal comprehensive plans. These investments will include not only roadway improvements, but expansion and promotion of transit and non-motorized transportation.
- Development under the Alternative 2030 Growth beyond the Growth Areas scenario will require substantially more improvements to the roadway portion of the transportation network with serious investment consequences and is inconsistent with the goals and objectives of this plan and the 2004 Strategies for State Policies in Spending and the Kent County and municipal comprehensive plans. The level of investment needed for the roadway system will use resources that could otherwise be spent on expanding and promoting transit and non-motorized transportation.
- If transportation improvements do not keep pace with development, the transportation network will experience significant levels of deterioration along major transportation corridors and decreased levels of service.

Summary of Challenge

The Dover/Kent County region faces a serious challenge in fulfilling the Vision expressed in Chapter Two while meeting transportation needs through the year 2030. The Vision describes a future in which the quality of life remains high and the transportation system operates at least as well, if not better, than it does today using more alternatives.

The land use analysis completed in support of this planning effort reveals that prior to the adoption of the Strategies for State Policies in Spending, the Kent County Growth Zone and recent amendments to the Kent County Subdivision Ordinance, patches of dense development occurred outside of the established growth area and in areas considered Level 3 and Level 4 Investment Areas. A continuation of this development could divert transportation investments from more densely developed areas and areas within the growth area in need of infrastructure expansion to keep pace with desired development consistent with state spending policies (Level 1 and Level 2 Investment Areas). It is important that all levels of government continue their current policies and plans.

Travel demand projections reveal that though the majority of the transportation system operates effectively now, significant congestion can be expected to occur in the future if no improvements are made. However, that congestion can be reduced using effective growth management policies and actions. Analysis of transportation improvement strategies shows that no single strategy can be expected to mitigate that congestion. Operation and management of the region's transportation system needs to include all travel modes.

The next two chapters outline the strategies and actions that comprise the heart of the Plan. They are intended to work in a complementary fashion to meet the diverse needs of a diverse population.